LESSON MAKER PRO

Measure It Out

Use right triangles and volume to solve real-world measurements.

GRADE 8 · 8.GSR.8

8.GSR.8 "Solve contextual, geometric problems involving the Pythagorean Theorem and the volume of geometric figures to explain real phenomena."

NAME _____ DATE _____

TWO USEFUL FORMULAS

For a right triangle, square the two legs, add the results, and take the square root to find the hypotenuse: a^2 + b^2 = c^2. For a rectangular prism, multiply length × width × height to find volume, and write the answer in cubic units.

WORKED EXAMPLE

A right triangle has legs that are 9 cm and 12 cm long. Find the hypotenuse.

1. Let c be the hypotenuse.
2. c^2 = 9^2 + 12^2
3. c^2 = 81 + 144 = 225
4. c = 15

Answer: 15 cm

PRACTICE 6 problems

1 A right triangle has legs of 7 cm and 24 cm. Find the hypotenuse.

ANSWER _____

2 A right triangle has a hypotenuse of 26 cm and one leg of 10 cm. Find the other leg.

ANSWER _____

3 A right triangle has legs of 20 m and 21 m. Find the hypotenuse.

ANSWER _____

4 A rectangular prism is 4 cm long, 6 cm wide, and 7 cm high. Find its volume.

ANSWER _____

5 A cube has side lengths of 5 inches. Find its volume.

ANSWER _____

6 A rectangular prism has a base area of 18 cm^2 and a height of 7 cm. Find its volume.

ANSWER _____

APPLY IT Show your work

1 A student is making a rectangular backdrop for a gaming club event. The backdrop is 18 ft wide and 24 ft tall. A string of lights will run from one corner to the opposite corner. How many feet of lights are needed?

WORK SPACE

ANSWER _____

2 Student council is packing giveaway pencils in a rectangular box that is 11 in long, 4 in wide, and 3 in high. What is the volume of the box?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A rectangular equipment case is 6 cm long, 8 cm wide, and 24 cm high. Find the volume of the case. Then find the length of the longest straight object that can fit inside from one corner to the opposite corner.

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ANSWER KEY

Measure It Out

GRADE 8 · 8.GSR.8

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A right triangle has legs of 7 cm and 24 cm. Find the hypotenuse.	**25 cm**
2	A right triangle has a hypotenuse of 26 cm and one leg of 10 cm. Find the other leg.	**24 cm**
3	A right triangle has legs of 20 m and 21 m. Find the hypotenuse.	**29 m**
4	A rectangular prism is 4 cm long, 6 cm wide, and 7 cm high. Find its volume.	**168 cm^3**
5	A cube has side lengths of 5 inches. Find its volume.	**125 in^3**
6	A rectangular prism has a base area of 18 cm^2 and a height of 7 cm. Find its volume.	**126 cm^3**

PART 2 · APPLY IT

1. **30 ft** Use the Pythagorean Theorem: c^2 = 18^2 + 24^2 = 324 + 576 = 900. The diagonal is 30 ft.
2. **132 in^3** Multiply the three dimensions: 11 × 4 × 3 = 132. The box holds 132 cubic inches.

CHALLENGE

Volume: 1152 cm^3. Longest straight object: 26 cm.

Accept equivalent cubic-unit notation, such as cm³ or cm^3. For Pythagorean Theorem problems, accept correct work that finds the positive length only.